

The Korean Intellectual Property Office (KR)
Unexamined Patent Application (A)

(51) Int.CI.
A47L 15/18

(11) Unexamined Publication 10-2003-0044535

No

(43) Unexamined Publication 2003-06-09

Date

(21) Application No 10-2001-0075330

(22) Application Date 2001-11-30

(74) Agent Yong-In Kim
Chang-Seop Shim

(71) Applicant LG Electronics Inc.

(72) Inventor

Jae-Hun Ha

■ Examination Requested : EopEum

(54) DEVICE FOR SPRAYING WATER IN THE CLEANSING MACHINE

Abstract

Machine Translation **Human Translation**

1 The invention relates to the device for spraying washing water possible the washing water nots be water-leaked in the connection unit of the washing water pipe line and upper spray arm by more particularly setting up inlet port opening and closing member in the cleansing water inlet of the upper spray arm as the dish washer. For this, the present invention is to provide the device for spraying washing water of the dish washer which forms the cleansing water inlet connected to the washing water pipe line (8) of 2 as to the dish washer which includes the lower part of the upper rack and the lower rack which is installed in order to mount the tableware inside the washing tub and upper rack and lower rack with washing water pipe line : connected to each spray arm in order to supply the washing water to the respective installed top and bottom spraying arm and top and bottom spraying arm and is comprised of the upper spray arm (5) in order to change establishment high and low of the upper spray arm (5) corresponding to according to establishment high and low of the upper rack (4), and is done by feature to set up inlet port opening and closing member (60) which are opened if the water pressure works in the cleansing water inlet of the upper spray arm (5) and are closed if the water pressure is canceled.

Machine Translation **Human Translation**

PURPOSE: A washing water injecting apparatus for a dishwasher is provided to prevent leakage of washing water by installing an opening and closing member to a washing water inlet of an upper injecting arm.

CONSTITUTION: A washing water injecting apparatus for a dishwasher has two washing water inlets(51,52) and an opening and closing member(60) of the inlet. Washing water inlets are formed to an upper injecting arm to change an installing height of the upper injecting arm corresponding to an installing height of an upper rack to contact a washing water pipe(8). The opening and closing member is installed to the washing water inlet to be opened in applying hydraulic pressure and to be closed in releasing hydraulic pressure. Thereby, leakage of washing water is prevented by installing the opening and closing member without separate components like a check valve and a water leakage preventing member.

► Representative Drawing(s)**Fig. 4****► Keyword(s)**

The dish washer, and the spray arm.

Description**► Brief explanation of the drawing**

- 2 Fig. 1 is a schematic configuration diagram showing the conventional dish washer structure.
- 3 Fig. 2 is an operation state diagram showing the operation state of the structure of high setting up the upper spray arm in the washing water pipe line of Fig. 1 and the check valve using the same.
- 4 Fig. 3 is an operation state diagram showing the operation state of the structure of low setting up the upper spray arm in the washing water pipe line of Fig. 1 and the check valve using the same.
- 5 Fig. 4 is a cross-sectional view showing the state where inlet port opening and closing member are installed in the invention upper spray arm.
- 6 Fig. 5 is a front view showing inlet port opening and closing member structure installed at the washing water pipe line of Fig. 4.
- 7 Fig. 6 is an operation state diagram showing the operation state of the structure in which the upper spray arm is high installed in the washing water pipe line of Fig. 4 and inlet port opening and closing member using the same.
- 8 Fig. 7 is an operation state diagram showing the operation state of the structure in which the upper spray arm is low installed in the washing water pipe line of Fig. 4 and inlet port opening and closing member using the same.
- 9 The description * of the symbol about the main part of * drawing.
- 10 3: washing pump 4: upper rack.
- 11 5: upper spray arm 6: lower rack.
- 12 7: bottom spraying arm 8: washing water pipe line.
- 13 8a: outlet 5a: expanding portion.
- 14 15: pressurization member 50: upper spray arm.
- 15 51: first inlet 52: the second inlet port.
- 16 60: inlet port opening and closing member 61: first switching part.
- 17 62: second opening and closing part 63: insertion part.
- 18 64: prevention of leakage part.

► Details of the Invention**► Purpose of the Invention**

The Technical Field to which the Invention Belongs, and the Prior Art in that Field

- 19 The invention relates to the dish washer, more, particularly, the device for spraying washing water.
- 20 The general dish washer is the apparatus for jetting the washing water on the upper rack and lower rack and washing the tableware mounted in each rack.

- 21 Hereinafter, it is the same as that of the next time referring to Fig. 3, if it illustrates about the conventional dish washer through the reference view drawing 1.
- 22 Fig. 1 is a schematic configuration diagram showing the conventional dish washer structure. Fig. 2 is an operation state diagram showing the operation state of the structure of high setting up the upper spray arm in the washing water pipe line of Fig. 1 and the check valve using the same. Fig. 3 is an operation state diagram showing the operation state of the structure of low setting up the upper spray arm in the washing water pipe line of Fig. 1 and the check valve using the same.
- 23 Referring to Fig. 1, the upper spray arm (5) and the bottom spraying arm (7) in which the dish washer is connected to the upper rack (4) which is installed within the tub (1) and puts on the tableware and lower rack (6), and the thump (2), storing the washing water at the lower part of the tub (1) and the washing pump (3), pumping the washing water stored in the thump (2) and the washing water pipe line (8), which is connected to the washing pump (3) and guides the flow channel of the washing water and washing water pipe line (8) and spraying the washing water on the tableware which is puts on the upper rack (4) and lower rack (6) are equipped.
- 24 At this time, according to the size of the tableware which the dish washer puts on the upper rack (4), it has the structure of changing the installation position of the upper rack (4).
- 25 That is, in order to broaden the space with the upper side of the upper rack (4) and tub (1) in case the size of the equation is big, the upper rack (4) is dropt to the lower part and it sets up. The upper spray arm (5) installed at the lower part of the upper rack (4) the installation position of the upper rack (4) is changed drops to the lower part and it has to set up.
- 26 It particularly decides to illustrate about the structure of this device for spraying washing water with reference to the reference view drawing 2.
- 27 The washing water pipe line (8) the one end is connected to the washing pump (3) and the other end part is connected to the upper spray arm (5) at the same time.
- 28 The other end part of the washing water pipe line (8) is curve-cut in "ㄱ" type. And the expanding portion (5a) is formed in one end of the upper spray arm (5). Cleansing water inlets (11,12) of 2 are formed in the expanding portion (5a).
- 29 2 cleansing water inlets (11,12) is that the cleansing water inlet (12) of the washing water Yoo of the upper spray arm (5) the double one and the straight flow path it weaves by hands is formed in the longitudinal direction of the upper spray arm (5). This expanding portion (5a) has the shape extended among the direction to the longitudinal direction of the upper spray arm (5) in a specific direction.
- 30 Therefore, one cleansing water inlet (hereinafter, the first inlet) (11) is positioned on the flow channel and the straight flow path of the spray arm. And the cleansing water inlet (hereinafter, the second inlet port) (12) of the other one is positioned on the curve flow path formed in the extended part of the expanding portion (5a).
- 31 The check valve (13) is hinge-coupled between the first inlet (11) and the second inlet port (12). And the check valve (13) is formed with the plate shape.
- 32 In this check valve (13) is the hinge binding site, the length has to be long as much as the length has to be long as much as the first inlet (11) is covered and the length to the end tip hangs on the expanding portion (5a) of the upper spray arm (5) at the same time the curve flow path connected with the second inlet port (12) is blocked.
- 33 Moreover, in the edge part of the second inlet port (12) and the first inlet (11), the separate water leakage prevention material (14) is set up. In that way gap between two members are closely adhered closely according to insert the outlet (8a) of the washing water pipe line (8) into cleansing water inlets (11,12).
- 34 That is, the water leakage prevention material (14) is set up in the upper spray arm (5) so that such hole be corresponded to first and second inlet port while hole corresponding to first and second inlet ports (11,12) of the upper spray arm (5) in the water leakage prevention material (14) are formed.
- 35 By letting unite by hook the pressurization member (15) in the upper spray arm (5) after setting up the water leakage prevention material (14) in the upper spray arm (5) it sets up so that the pressurization member be pressurized in the upper spray arm.

- 36 Accordingly, it can prevent from the water leakage prevention material (14) of the flexible material coming off from the upper spray arm (5).
- 37 In the meantime, if the upper rack (4) is set up in the high location within the tub (1), as shown in Fig. 2, the first inlet (11) of the upper spray arm (5) is inserted into the outlet (8a) of the washing water pipe line (8).
- 38 In this way, in the installed state, if the dish washer is operated after putting in the tableware into the upper rack (4) and lower rack (6), the washing water sent in custody through the washing pump (3) is flowed in into the first inlet (11) through the washing water pipe line (8).
- 39 At this time, until the water pressure hangs the end tip on the expanding portion (5a), the check valve (13) closing the first inlet (11) is circulated.
- 40 Like this, if the check valve (13) is completely opened, with blocking the curve flow path formed to side the second inlet port (12), the check valve (13) completely opens the straight flow path.
- 41 Accordingly, the upper spray arm (5) is supplied according to the arrow direction shown in the washing water is Fig. 2 and it is emitted to the upper rack (4).
- 42 Next, when the size of the tableware placed on the upper rack (4) is big, the upper rack (4) is dropt to the lower part and it has to set up. And the upper spray arm (5) drops to the lower part and it has to set up.
- 43 If the upper rack (4) is set up in the low location, by inserting the outlet (8a) of the washing water pipe line (8) into the second inlet port (12) of the upper spray arm (5) as shown in Fig. 3, the upper spray arm (5) is set up in the low location.
- 44 Accordingly, the space between the top of the upper rack (4) and the tub (1) can be adequately secured as much as the tableware can be accommodated.
- 45 In this way, in the installed state, if the dish washer is operated after putting in the tableware into the upper rack (4) and lower rack (6), the washing water sent in custody through the washing pump (3) is flowed in into the second inlet port (12) through the washing water pipe line (8).
- 46 At this time, the check valve (13) closing the first inlet (11) and then closes the first inlet (11) with the water pressure.
- 47 Accordingly, it is flown according to the flow channel of the upper spray arm (5) after passing through the curve flow path like the arrow direction shown in the washing water is Fig. 3.
- 48 But the check valve (13) is circulated with the water pressure and it prevents from the washing water being flowed out through the first inlet (11) or the second inlet port (12). However, gap between the first inlet (11) and the expanding portion (5a) contacting the check valve (13) are done with the sealing (sealing) but gap have limit.
- 49 Moreover, fluctuation uses abusive the pressure of the washing water which it reaches the check valve (13) because of pumping the washing water through the diffusion pump and inflow is not per hour identical with the unit of the washing water.
- 50 Accordingly, since the washing water is unable to pressurize the check valve (13) to the fixed water pressure, the check valve (13) is minute, it does in the washing water flow and the amount of leakage increases and the washing efficiency of the washing water is reduced.
- 51 Moreover, the noise can increase as the check valve (13) and then bumps against into the expanding portion (5a) and the first inlet (11). And while the check valve (13) bumps against the expanding portion (5a) and the first inlet (11) in the outage of the initial in which the washing water is provided to the upper spray arm (5) or the washing water and the noise is generated, the check valve (13) can be damaged by such impact.

Technical challenges of the Invention,

- 52 In order that the above-described overall problem is solved, the invention is done by the purpose to set up inlet port opening and closing member in the cleansing water inlet of the upper spray arm and prevent from the washing water being water-leaked. When the washing water is flowed in the upper spray arm.

‣ Structure & Operation of the Invention

- 53 To accomplish the above objects, the present invention is to provide the device for spraying washing water of the dish washer which the upper spray arm forms the cleansing water inlet connected to the washing water pipe line of 2 as to the dish washer which includes the lower part of the upper rack and the lower rack which is installed in order to mount the tableware inside the washing tub and upper rack and lower rack with washing water pipe line : connected to each spray arm in order to supply the washing water to the respective installed top and bottom spraying arm and top and bottom spraying arm and is comprised of order to change establishment high and low of the upper spray arm corresponding to according to establishment high and low of the upper rack, and is done by feature to set up inlet port opening and closing member which are opened if the water pressure works in the cleansing water inlet of the upper spray arm and are closed if the water pressure is canceled.
- 54 The same drawing burn decides to be given about the same part as convention and the description decides to be omitted about the invention device for spraying washing water about the structure of being identical.
- 55 Hereinafter, it is the same as that of the next time referring to Fig. 7, if it illustrates about the device for spraying washing water of the invention dish washer through the reference view drawing 4.
- 56 Fig. 4 is a cross-sectional view showing the state where inlet port opening and closing member are installed in the invention upper spray arm. Fig. 5 is a front view showing inlet port opening and closing member structure installed at the washing water pipe line of Fig. 4.
- 57 Referring to Fig. 4, in one end of the upper spray arm (50), the expanding portion (5a) is formed. Cleansing water inlets (51,52) of 2 are formed in the expanding portion (5a).
- 58 In order to weave by hands in the longitudinal direction of the upper spray arm (50) it is in a line, 2 cleansing water inlets (51,52) is formed. And the cleansing water inlet of the upper spray arm (50) is formed so that one be located among two on the washing water flow channel and the straight flow path. This expanding portion (5a) has the shape extended among the direction to the longitudinal direction of the upper spray arm (50) in a specific direction.
- 59 At this time, one cleansing water inlet (hereinafter, the first inlet) (51) is positioned on the flow channel and the straight flow path of the spray arm. And the cleansing water inlet (hereinafter, the second inlet port) (52) of the other one is positioned on the curve flow path formed in the extended part of the expanding portion (5a).
- 60 In the cleansing water inlet of the upper spray arm (50) having this kind of structure, inlet port opening and closing member (60) which are opened if the water pressure works and are closed if the water pressure is canceled are set up.
- 61 In inlet port opening and closing member (60), with being formed with the hollow cupola-shape, torn opening and closing parts (61,62) of shape are formed with the diametric direction with 2 . Each close and open part (61,62) are inserted and set up in first and second inlet ports (51,52). And the washing water pipe line is selectively inserted and set up in one among opening and closing part of 2. The rubber or the silicon is presented in the material of inlet port opening and closing member (60).
- 62 Accordingly, if the washing water is flowed in, opening and closing part inserted into the washing water pipe line (8) are opened. Opening and closing part in which the washing water pipe line (8) is not installed are closed and the water leakage of the washing water is prevented.
- 63 At this time, opening and closing parts (61,62) are formed so that the torn part be protruded to the outer side with prescribed distance. It respects to help the prevention of leakage of the washing water since the torn part of opening and closing parts (61,62) increases area which become with inter contact, it is this.
- 64 If this kind of inlet port opening and closing member (60) are looked at in the side in which the washing water is discharged, the part is torn part is positioned in the central part of hemisphere.
- 65 In the meantime, in inlet port opening and closing member (60), the prevention of leakage part (64) is formed in order to be protruded to the central according to the girth of opening and closing parts (61,62). Accordingly, the washing water pipe line (8) and opening and closing part (61,62) interval are closely adhered closely when inserting the washing water pipe line (8) into opening and closing part of the prevention of leakage part (64). Therefore, the water leakage of the washing water can be prevented.
- 66 Moreover, in the girth of opening and closing parts (61,62), the insertion part (63) protruded to the outer side is formed. The pressurization member (15) is set up after corresponding to the insertion part (63) in the edge part of cleansing water inlets (51,52).

- 67 At this time, the outer side surface edge part is curve-cut in the pressurization member (15) and the hook groove is formed in the inner side of the bent portion at the same time. And in the expanding portion (5a) end edge part of the upper spray arm (5), the hook portion is formed.
- 68 Accordingly, the pressurization member (15) is unite by hook let after setting up inlet port opening and closing member (60) of the flexible material in the upper spray arm (5). In this way, by fixing the girth of inlet port opening and closing member (60) to be stabilized in the inlet port it can prevent in the washing water inflow from opening and closing parts (61,62) being broken away from while opening or the insertion part (63) which has the softness according to be closed is piled up.
- 69 Referring to Fig. 7, it decides to illustrate about the work for of the device for spraying washing water of the dish washer having this kind of structure with the reference view drawing 6.
- 70 Fig. 6 is an operation state diagram showing the operation state of the structure in which the upper spray arm is high installed in the washing water pipe line of Fig. 4 and inlet port opening and closing member using the same. Fig. 7 is an operation state diagram showing the operation state of the structure in which the upper spray arm is low installed in the washing water pipe line of Fig. 4 and inlet port opening and closing member using the same.
- 71 The washing water pipe line (8) is inserted into opening and closing part (it hereinafter says to be the first switching part) (61) installed at as shown in Fig. 6, the first inlet (51) of the upper spray arm (50) the upper rack (4) is set up in the high location within the tub (1).
- 72 In this way, in the installed state, if the dish washer is operated after putting in the tableware into the upper rack (4) and lower rack (6), the washing water sent in custody through the washing pump (3) is flowed in the first switching part (61) through the washing water pipe line (8).
- 73 At this time, the first switching part (61) of the flexible material is opened with the water pressure of the washing water supplied to the first switching part (61) so that the torn part be comprised approximately, circular.
- 74 Simultaneously, in opening and closing part (it hereinafter says to be second opening and closing part (62)) (62) installed at second inlet port (52), the water pressure works in the upper spray arm (50) the washing water pipe line (8). Therefore, the having the torn shape of second opening and closing part (62) part adheres closely and the part prevents the water leakage of the washing water.
- 75 Accordingly, the upper spray arm (50) is supplied according to the arrow direction shown in the washing water is Fig. 2 and it is emitted to the upper rack (4).
- 76 Next, when the size of the tableware placed on the upper rack (4) is big, the upper rack (4) is dropt to the lower part and it has to set up. And accordingly the upper spray arm (50) drops to the lower part and it has to set up.
- 77 When the upper rack (4) is set up in the low location, the outlet (8a) of the washing water pipe line (8) as shown in Fig. 7 is inserted and is installed in second opening and closing part (62).
- 78 Accordingly, the space between the top of the upper rack (4) and the tub (1) can be adequately secured as much as the tableware can be accommodated.
- 79 In this way, in the installed state, if the dish washer is operated, the washing water sent in custody through the washing pump (3) is flowed in into second opening and closing part (62) through the washing water pipe line (8).
- 80 Subsequently, second opening and closing part (62) are opened by the water pressure to circular. Circular has the first switching part (61) to the closed state.
- 81 At this time, in second opening and closing part (62), the water pressure works in the washing water pipe line (8) to the upper spray arm (50) direction. And the water pressure works in the first switching part (61) in the upper spray arm (50) to the washing water pipe line (8).
- 82 The has the torn shape of the first switching part (61) with the work for of this water pressure part is more shut tightly and the part which prevents from the washing water being water-leaked.
- 83 Accordingly, it is flown according to the flow channel of the upper spray arm (50) after passing through the curve flow path like the arrow direction shown in the washing water is Fig. 7.

- 84 As described above, the water leakage of the washing water was prevented by setting up inlet port opening and closing member (60) in first and second inlet ports (51,52) of the upper spray arm (50).
- 85 Moreover, since having the structure of opening opening and closing parts (61,62) of the flexible material with the water pressure of the washing water, the noise generated in the dish washer driving was reduced.
- 86 And in the invention without the need to make the check valve (13), and the water leakage prevention material (14) like convention with the separate part, it integrately formed and inlet port opening and closing member (60) altogether performed the function of the water leakage prevention material (14) and conventional check valve (13).

▶ Effects of the Invention

- 87 As described above, with preventing the water leakage of the washing water, the invention reduced the noise generated in the cleansing device driving.
- 88 Moreover, by reducing the number of parts, the number of assembly process of the dish washer was decreased and the production efficiency of product was made enlarged.

Scope of Claims

Claim[1] :

- 89 The device for spraying washing water of the dish washer which includes the lower part of the upper rack and the lower rack which is installed in order to mount the tableware inside the washing tub and upper rack and lower rack with washing water pipe line : connected to each spray arm in order to supply the washing water to the respective installed top and bottom spraying arm and top and bottom spraying arm and is made, wherein the upper spray arm establishment high and low of the upper spray arm corresponding to are changed according to establishment high and low of the upper rack forms the cleansing water inlet connected to the washing water pipe line of 2; and it sets up inlet port opening and closing member which are opened if the water pressure works in the cleansing water inlet of the upper spray arm and are closed if the water pressure is canceled.

Claim[2] :

- 91 The device for spraying washing water of the dish washer of claim 1, wherein in inlet port opening and closing member, opening and closing part which have the shape which is torn to the diametric direction with being formed into the hollow cupola-shape are formed with 2 ; each close and open part are inserted and set up in the cleansing water inlet; and the washing water pipe line selectively is inserted and is installed in one among opening and closing part of 2.

Claim[3] :

- 93 The device for spraying washing water of the dish washer of claim 2, wherein in opening and closing part, the torn part is formed so that the part be protruded to the outer side with prescribed distance.

Claim[4] :

- 95 The device for spraying washing water of the dish washer of claim 2, wherein in inlet port opening and closing member, the prevention of leakage part is formed in order to be protruded to the central according to the girth of opening and closing part; and the washing water pipe line and opening and closing part interval are closely adhered closely when inserting the washing water pipe line into opening and closing part.

Claim[5] :

- 97 The device for spraying washing water of the dish washer of claim 2, wherein opening and closing part of inlet port opening and closing member form the insertion part protruded to the outer side in girth; and by setting up the pressurization member after corresponding to the insertion part in the edge part of the cleansing water inlet it fixes inlet port opening and closing member on the upper spray arm.

Claim[6] :

- 99 The device for spraying washing water of the dish washer of claim 1, wherein inlet port opening and closing member are made of the rubber material or the silicon material.

